UCRL-JC-123314 Abs

Indirect Drive Ignition Capsules for the National Ignition Facility* S. V. Weber, T. R. Dittrich, S. W. Haan, S. M. Pollaine, and G. L. Strobel, *Lawrence Livermore National Laboratory* - We have examined several alternative designs for ignition capsules which differ in ablator composition, capsule size, hohlraum dimensions, total laser energy, and peak power. These designs illustrate options for balancing constraints of hydrodynamic stability, laser-plasma instability, fabrication capabilities, and laser performance. Robustness studies show that the capsule can tolerate expected fluctuations in beam pointing and power balance, x-ray illumination asymmetry resulting from hohlraum dynamics, as well as roughness of the ablator and DT ice surfaces. Adjustments of laser beam angles and pointing have reduced the amplitude of the Legendre P_6 moment of the capsule irradiation uniformity, resulting in more uniform implosions and higher calculated yields than in previous integrated capsule-hohlraum simulations. The laser beam path through the hohlraum is also less impeded by plasma blown off of the hohlraum wall than in previous designs, due to increased He-H gas density inside the hohlraum. Tradeoffs leading to the final choice of the NIF beam locations will be discussed. Designs at laser energies down to 0.9 MJ provide confidence in the robustness of the 1.3 MJ point design and demonstrate ability to accommodate energy losses in the laser or in the target. Designs with peak radiation temperatures of 250 eV and 300 eV differ in their susceptibility to laser-plasma instabilities. Thus, options exist for adjusting designs as our understanding of these processes evolves. This leads to confidence that ignition will be achieved with the 1.8 MJ, 0.351 μm NIF laser facility.

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* Work performed under the auspices of the U. S. Department of Energy by the Lawrence Livermore National Laboratory under Contract W-7405-ENG-48.